**Instructions for running *TMS-via-Arduino***

**Download and Installation**

1. Download the project

Github: <https://github.com/eugsokolov/tms-via-arduino/>

2. Install Python v3.6

For Linux/Mac, install Python: <https://www.python.org/downloads/>

For Windows, install Python:<https://www.python.org/downloads/release/python-360/> (Windows x86-64 executable installer)

3. Install the proper Python libraries

For Linux/Mac, manually install the libraries:

- pyserial: <http://pyserial.readthedocs.io/en/latest/pyserial.html>

- matplotlib: <http://matplotlib.org/users/installing.html>

For Windows, open the command terminal (cmd.exe)

Run:

- “py -3.6 -m pip install pyserial”

- “py -3.6 -m pip install matplotlib”

When installing, be careful to point to the right directories. You should now be able to run the Python script: *tms-program.py*

**Running the Program**

1. Edit the configuration file: *config.csv*

Configuration file must be saved in the same directory as the *tms-program.py* script file. Be sure to save the configuration file as a CSV (comma separated values).

What do the values mean?

- Name: the test participant's name

- Sex: the test participant's gender

- Iterations per user: number of iterations to display objects

- Screen: select display mode - display a single object or a side by side aka double

- Type: select type of object - image, text, or mouse

- Directory: location of objects - point to path of images, or text file of words (on Windows, must specify **full** path)

- TMS port: port of Arduino-TMS adapter - on Windows, usually COMS1, COMS2, etc.

- TMS before or after: do we wish to fire the TMS machine before or after showing an image?

- Fire iteration: specify when to fire the TMS as an array, ie [1, 2, 3] will fire 1st, 2nd, and 3rd iterations. Alternatively, we can specify random in which case a fair coin will be flipped to determine fire

- Time to fire: millisecond time when to fire before/after showing an image

- Event end: how to end the event? Keypress action or time?

- Event end time: if event end by time, how long between events?

- Refresh: refresh image after each iteration event?

- ISI step: show an ISI image between each iteration event? (on Windows, must specify **full** path)

- ISI step duration: if so, for how long?

- ISI end: show an ISI image at the end of the program run? (on Windows, must specify **full** path)

- ISI end duration: if so, for how long?

2. Run the script: *tms-program.py*

In Linux/Mac, open a terminal and run the script by executing the command: *python tms-program.py*

In Windows, open a Python editor such as IDLE or PyCharm and run the module (shortcut F5 sometimes)

3. Log

At the end of the trial, a log file will be created as *name-date.log*

**Optional**

Download Arduino to change adapter configurations

Arduino: <https://www.arduino.cc/en/Main/Software>

Edit the *tms.ino,* at your own will and risk, file in the Arduino IDE.

Reupload the new program to the adapter.